which we may infer that the Hindus were aware not only of the therapeutic virtues of mercurials, but had recognised their remarkable antiseptic and preservative properties. In fact, according to Dr. Rây, the history of Hindu chemistry is emphatically the history of the progress of chemical operations grouped round the preparations of mercury. So much is this the case that in ascertaining the age of a medical work or of a chemical Tantra it may be laid down as a fairly safe guide whether any mention of the use of mercury occurs in it, and, if so, in what particular form.

Dr. Rây gives a number of instances in which discoveries usually considered of Western origin are to be found noted in old Hindu treatises, such as those of Vrinda and Chakrapani. The Tantra, the "Rasarnava" (about 1200 A.D.), is a repository of chemical lore, with elaborate directions and details of the construction of apparatus, furnaces, hearths, etc., required for distillation, sublimation, calcination, extraction of metals, etc., and shows remarkable powers of keen and accurate observation, The necessity for experiments is strictly enjoined in most of these old works, and the value of the Baconian method and of the precepts of the "experimentarian philosophers" of the Royal Society of Charles II. was long ago recognised and appreciated by their Indian predecessors. Even the influence of the experimental method on teaching was not lost sight of. "They alone," says Dhundhukanatha, "are to be regarded as real teachers who can show by experiments what they teach. They are the deserving pupils who, having learned the experiments from their teachers, can actually perform them. The rest, both the teachers and pupils, are merely stage actors."

Verily one generation passeth away and another generation cometh, and there is no new thing under the sun.

T.

THE SUPPLY OF OPTICAL GLASS AND INSTRUMENTS.

OPTICAL matters, and technical education generally, continue to claim their share of public attention. Following upon the article which appeared in our issue of May 6 (p. 266) on the supply of optical glass, we had the important debate, published verbatim in our last issue, on the proposed Advisory Council on Industrial Research which arose on the education estimates. More recently, on the motion for the Whitsuntide adjournment on May 19, an important speech, which was entirely devoted to optical matters, was made by Sir Philip Magnus. The speech, so far as it related to the supply of optical glass, necessarily traversed the ground covered by our article of May 6, but added specific instances of the German "wire entanglements" woven round the optical trade.

The speech, however, went further, and dealt with the supply of optical instruments, treating in detail the economic and educational aspects of the question. On the economic side it was laid down as an axiom "that what is essential to the safety of the realm must be produced within the Empire." The questions of high tariff and of a bonus on production were referred to, but the suggestion most favoured advocated that it be an enforced condition of all Government contracts that every part of the optical instruments contracted for should be made in this country. With the Government trade thus secured, it was argued that German attempts to capture the whole industry must fail.

On the educational side, the country's requirements, which are well known to our readers, were summarised, but perhaps too little was made of the necessity, which is strongly supported by leading experts, for the provision of, at least, one place where the whole range, from the lowest to the highest, of teaching in applied optics shall be available. The final suggestion made was "that a small committee should be appointed to co-ordinate the work of" the National Physical Laboratory, the Imperial College of Science and Technology, and the Technical Optics Department of the Northampton Polytechnic Institute. Sir Philip Magnus was followed by two other speakers, but the debate was interrupted by the Prime Minister's important statement regarding a Coalition Government.

Later on, Dr. Addison replied sympathetically on behalf of the President of the Board of Trade, and assured the House that the "subject was being closely attended to, and that the Government hoped at a very early date to have a comprehensive scheme to deal with this somewhat complicated and technical question."

NOTES.

We regret to announce the death, on May 23, at eighty-one years of age, of Dr. Hugo Müller, F.R.S., past-president of the Chemical Society.

THE death is announced, in his seventy-first year, of Dr. Joseph J. Hardy, who had held the chair of mathematics and astronomy at Lafayette College, Pennsylvania, since 1891. He was the author of "Analytic Geometry, Infinitesimals and Limits."

THE Paris correspondent of the *Times* announces the death of M. Pierre Martin, the inventor of the Martin process of steel manufacture. It was only last week that we announced that the Iron and Steel Institute had just conferred on M. Martin the Bessemer gold medal for 1915.

THE deaths are announced in *Science* of Prof. J. W. Seaver, for twenty-five years director of the Yale gymnasium, and professor of hygiene in the University, on May 5, at the age of sixty years, and of Mr. W. H. Reed, curator of the museum and instructor of geology in the University of Wyoming, noted for his collections of vertebrate fossils, who died at the age of sixty-seven years on April 24.

THE Albert medal of the Royal Society of Arts for the current year has been awarded to Sir J. J. Thomson, for his researches in physics and chemistry, and their application to the advancement of arts, manufactures, and commerce. The Albert medal was founded in 1863 to commemorate the Prince Consort's presidency of the society, and is awarded "for distinguished merit in promoting arts, manufactures, and commerce."

DR. E. O. HOVEY, of the American Museum of Natural History, has just returned from a three months' expedition to the Lesser Antilles. The time was largely given to an examination of Mont Pelée, the Soufrière, and other volcanoes of this region. It is reported by Dr. Hovey that the activity of Mont Pelée has continually diminished since the great outbursts of 1902–3. On the east or windward side vegetation has re-established itself up to the very summit, and even the forest is beginning to reassert itself. The rocks of the new cone are more or less thickly coated with moss.

WE announced last week the award, by Columbia University, of the Barnard gold medal to Prof. W. H. Bragg and his son, Mr. W. L. Bragg, for their researches in molecular physics and in the particular field of radio-activity. The Butler gold and silver medals have also been awarded. The gold medal is awarded every fifth year for the most distinguished contribution made during the preceding five-year period to philosophy or to educational theory, practice, or administration. The silver medal is awarded annually to that graduate of Columbia University who has, during the year preceding, shown the most competence in philosophy or in education theory, practice, or administration, or has during that time made the most contribution of any of these. The former has been awarded to the Hon. Bertrand Russell, lecturer and fellow of Trinity College, Cambridge, for his contributions to logical theory. The silver medal has been awarded to Prof. E. P. Cubberley, of Leland Stanford Jr. University, for his contributions to educational administration.

A SUGGESTION for the defence of our soldiers against poisonous gas in the present war is made by Dr. F. C. Coley, of Newcastle-upon-Tyne, in a letter to the *Morning Post* of May 25. He proposes the use, in the trenches near enough to the enemy to be in danger from such gases, of rotary fan-blowers worked by hand placed at about every three or four yards. The fan-blowers should be connected with pipes going through the base of the earthwork in front of the trench. If the number of blowers were equal to the number of gas cylinders used by the enemy, the blowers when vigorously worked would deliver a far greater volume of air than the volume of the poisonous gas, so that the gas would become much diluted, and with good respirators would be harmless to our men. We believe that experiments are being conducted at the front with the object of devising means to render the poisonous gases innocuous by spraying with water and in other ways. The former expedient would require only a supply of water in the trenches and a spraying apparatus, and it would seem to afford an effective means of protection.

MR. RICHARD KERR, the genial and well-known lecturer on astronomy, microscopy, and other scientific subjects, died on May 19, at sixty-five years of age, after suffering greatly from a complication of disorders. For the last two years he had shown signs of breaking down in health, partly owing to anxiety and the difficulty of getting and fulfilling a sufficient number of engagements to keep him fully employed. He leaves a widow and a family of four. About twenty years ago he was associated with such men as Huxley, Sir B. W. Richardson, and Lant Carpenter in the work of the Sunday Lecture Society, and he was well known at the leading literary and scientific institutions in London and the country as one of the most popular exponents of science. His pleasant and easy manner, with occasional gleams of Irish humour, made him welcome to his audiences. He was the author of many books and articles on the popular side of science, such as "The Hidden Beauties of Nature," "Nature, Curious and Beautiful," and "Wireless Telegraphy Popularly Explained." He had also two or three books ready for publication, but on account of the war he found it impossible to get them published. He was an artist of no mean merit, and drew the illustrations for his books and lantern-slides with his own hand. His ability was recognised by the Home Office, who employed him as a lecturer to H.M. Prisons.

IT is proposed to found a memorial in honour of the late Mr. E. T. Busk, who met his death in November last at Aldershot while flying his own stable aeroplane, owing to its destruction by fire, thus terminating a career already marked by fine achievement and full of promise for the future. At Cambridge he took first class honours in the Mechanical Sciences Tripos, and was awarded the John Wimbourne prize and a scholarship at King's College. After passing some years as an engineer, he joined the staff of the Royal Aircraft Factory, where he devoted his time especially to the mathematics and dynamics of stable flight of the full-size aeroplane, to researches into the nature and cause of wind gusts, and to the uses of aircraft in warfare for offensive and defensive purposes. Besides this work, he was entrusted with the general control of the chemical, metallurgical, and physical research and test work at the factory. The memorial will consist of (1) a studentship to enable a student to carry on some research in aeronautics or a kindred subject, and (2) a lecture on some such subject to be given annually by the holder of the studentship or by some other lecturer, and to be published in the *Aëronautical Journal*. Subscriptions to the amount of about 2500*l.* have been received or promised, and further contributions will be gratefully acknowledged by Sir Edward H. Busk, 11 Sussex Place, Regent's Park, N.W., or the secretary of the Aeronautical Society of Great Britain, 11 Adam Street, Adelphi, W.C.

ACCORDING to a "neutral" correspondent of the *Times*, the Germans are busy with the preparation of smoke bombs to be dropped from Zeppelins when the long-talked-of air-raid on London takes places. We are told that an eye-witness saw the smoke cloud spread over an area of several kilometres! There is little difficulty in constructing a bomb which shall explode at a given distance above the ground and produce a dense cloud, but it is doubtful whether such a smoke cloud could be made to spread over anything like a distance of kilometres. We are told further that these bombs will prevent attack by anti-aircraft guns and aeroplanes. How it is to stop the latter which travel at a much higher speed than a dirigible, and will certainly attack from above or at least on a level with the Zeppelin, is not clear. In the absence of any dissipating wind a Zeppelin free to choose her course may derive considerable advantage from a smoke bomb burst over a gun position, but some shots should certainly be fired before she has time to locate the gun, and then she must get well over the position to place the bomb effectively. Smoke is a very vague term, and whilst it may obscure physical vision may also be used to cover something far more dangerous. In this connection the warning issued by the Commissioner of Police to keep all windows and doors on the lower floors of houses closed, in the event of an air-raid, to prevent the access of deleterious gases is not without significance, and should certainly not pass unheeded.

The service of radio time signals which is now provided by the Union Government wireless telegraph stations at Cape Town (Slangkop) and Durban will be of inestimable value to shipping in South African waters. By means of such a service, vessels within range of the stations can ensure a precision of standard time which it would otherwise be impossible for them to obtain, and the new facilities should make for added safety in navigation. The Cape Town (call letters VNC) and Durban (VND) stations are open night and day, and work on a 600-metre normal wave. A special clock at the Cape Town Observatory is adapted to give automatically a series of signals extending over an interval of half a minute. The signals are transmitted at 11 p.m. Union time, which is equivalent to 9 p.m. Greenwich mean time, and shortly before that hour the clock is brought into conformity daily with the observatory standards. The time signal proper, which is preceded by the usual warning signal, consists of twelve dashes, each of about three-quarters of a second in duration, divided into five groups, the commencement of the separate dashes corresponding exactly with the following Greenwich mean times:—

Group I. h. m. s.	Group II. h. m. s.	Group III. h. m. s.	Group IV. h. m. s.	Group V. h. m. s.
8 59 30	8 59 38	8 59 44	8 59 48	8 59 54
8 59 32	8 59 40		8 59 50	8 59 56
8 59 34				8 59 58
				9 00 00

By means of a special relay the time signal is simultaneously transmitted to the Cape Town and Durban wireless stations, the signal to the latter station passing over the land telegraph wire connecting Cape Town and Durban, a distance of about 1100 miles. In addition to the time signals, both stations transmit each day, at 1 p.m., a report in plain language containing information concerning the meteorological conditions prevailing on the whole coast of the Union of South Africa.

The *Popular Science Monthly* for April contains a series of fifteen short articles dealing with American economic and social problems arising out of the war. Stress is laid primarily upon the necessity for the education of the American people in methods of maintaining health and prolonging life; it is shown that "degenerative diseases" are causing an increased death-rate which was nearly doubled between 1880 and 1910. The average man is not an able-bodied citizen; he is far below the attainable standard of physical soundness and efficiency. The war appears to cause the American to look more closely upon the value of a human life. A second point arises out of a consideration of the American mercantile marine. The merchant navy of the United States is totally inadequate to the carrying of more than one-tenth of the American trade. Americans are advised to seek for foreign trade with the same energy as they display in capturing markets in distant parts of the United States, and the Englishman is amused to learn that the American exporter is suspected of bad packing, lack of adaptability, and the dozen or so other faults which are alleged to be manifest among English exporters. Taken as a whole, the series is symptomatic of the stimulus which results from war; nothing can be quite the same again; distant America will share with the rest of the world in the changes, and notable Americans here display the tendency of their thoughts. The occasion for these articles was the meeting of the American Association for the Advancement of Science in December last.

The Zoological Society of Philadelphia is to be congratulated, since, according to its forty-third annual report, among a consignment of young bears, shipped from Europe as "Russian bears," two, a male and a female, prove on examination to be specimens of the rare blue bear of Tibet (*Ursus pruinosus*). The pathologist's report contains some valuable data on tuberculin tests, carried out on monkeys and birds, on enteritis among quails, and on larval and adult hook-worms, which were the cause of considerable mortality among the Canidæ during the year. Perhaps the most important parisitological item of the year was the discovery of cysts of *Coccidium bigeminum* in the fæces of a fox. This parasite has been found three times in man, and frequently in dogs, but it has never before been found in a wild animal.

Many items of more than usual interest are to be found in the Report of the South African Museum for 1914. In the first place, the director, Dr. Louis Péringuey, is able to state that the agitation, started some time ago in the Uitenhage district, for the destruction of the elephants in the Addo Bush, has not only failed, but that the Provincial Government is taking steps to ensure the safety of the three troops known to occupy the preserve. The herd apparently will have to be thinned, but no indiscriminate shooting will be allowed, and provision will be made for ensuring to the remainder a fair supply of water, the lack of which is oftener than not the cause of the animals' so-called depredations. The "wiping-out" of the herd, said to number 300 head, is no longer to be feared. Among the additions made to the collections during the year he directs special attention to "two extraordinarily large vessels affecting the shape of a hippopotamus" from southern Rhodesia. These bear a striking resemblance to the work characteristic of the early Egyptian civilisation, and afford a parallel to the large soap-stone bowls found at Zimbabwe by Bent, and the similar bowls used as fireplaces or ovens, found at Meroë and Abydos, close to the oldest known temples of Osiris.

A REPORT has recently been issued by the Fisheries Branch of the Department of Agriculture and Technical Instruction for Ireland on the outbreak of the disease known as "furunculosis," which attacked the salmon in the river Liffey in 1913. The report (Fisheries, Ireland, Scientific Investigations, 1914, ii (1915), price 4*d.*) is by Prof. A. E. Mettam of the Royal Veterinary College, Dublin. After giving a useful summary of previous literature dealing with the disease, the author records the results of careful microscopical and bacteriological examination of a number of diseased fish. Attention was first prominently directed to the disease in Great Britain by outbreaks which occurred in 1911 in the Wye, the Exe, the Teign, and the Dart, large numbers of salmon, trout, and other fish being found dead in these rivers. The epidemic was reported on by Dr. A. T. Masterman, of the English Board of Fisheries. Prof. Mettam confirms the accounts given by previous workers. The diseased fish, which may or may not show external boils or lesions, are infected by a micro-organism (*Bacillus salmonicida*) which occurs in immense numbers in pus from the boils and also in the blood. Infection takes place very rapidly through the skin or gills, or from infected food. Healthy fish placed in infected water often succumb within a few days. It is suggested that a river may become infected by fresh-run salmon from the sea. All that can be suggested to check the disease in a river is the immediate removal and destruction of all dead and dying fish. Care should also be taken not to transfer fish or fish fry from an infected river to one which is free from the disease.

IN Bulletin No. 19, issued by the North of Scotland College of Agriculture, Prof. James Hendrick describes the composition and value of liquid manure as produced under the farming conditions of the north-east of Scotland. It is well known that practically the whole of the potash and readily available nitrogen is found in the urine, and where the litter is unable to absorb this completely, the surplus drains to the liquid manure tanks. The practical difficulties in the way of utilising liquid manure to the best advantage have in the past led to a waste of valuable fertilising material. Since potash manures are practically unobtainable at present, any method of preventing waste of this element has a special significance. During four seasons, 1910–13, liquid manure was applied to grass-land on farms in the district at various times from December to March. In all cases there was a considerable increase in the hay crop from the manured land. The average value of the increase, where 2000 gallons of liquid manure per acre was given, was 25*s.* per acre, with hay at 51*s.* per ton. The objections of the practical man that liquid manure applied in mid-winter would be washed from the soil before the plant could make use of it were not borne out by these experiments, which showed that the increase of crop from land manured in December was as great as where the manure was applied in March. The analyses of the various manures showed that where the liquid was applied at the rate of 2000 gallons per acre, the application was equivalent to artificials costing about 2*l.* per acre. The great part of this value was recovered in the grass during the season of application.

IN the Annals of the South African Museum, vol. ix, part iv., Prof. Pearson continues the enumeration of the plants collected in the Percy Sladen Memorial Expeditions of 1908–9 and 1910–11 in South-west Africa. The various natural orders have been worked out principally by Miss R. Glover and Mrs. Bolus. Of the new species described and figured, *Nenax Dregei*, L. Bolus (Rubiaceæ), *Anticharis juncea*, L. Bolus, a spinescent scrophulariaceous shrublet from Great Namaqualand, *Agathosma Sladeniana*, R. Glover (Rutaceæ), and *Lotonotis exstipulata*, L. Bolus (Leguminosæ), from the Cape region, are some of the most interesting. In the same number Mr. Phillips described three new species of Proteaceæ.

THE report of the director of the Botanic Gardens and Government Domains, Sydney, New South Wales, contains an interesting account of the work done in the Botanic Gardens in particular, and includes a number of excellent photographs of various parts of these justly famed gardens. Following the example of Kew we are glad to notice that a list of the fauna of the gardens is being compiled, and a large number of different species are recorded in this report.

MR. E. D. MERRILL describes four new species of Dillenia and twelve of Saurawia from the Philippine Islands in the *Philippine Journal of Science*, vol. ix., No. 6. Some forty species of the latter genus are now known from the islands. One of the Dillenias, *D. cauliflora*, though collected as long ago as 1838 by Cuming, has only now been determined with the help of new material from the Island of Samar. The Cauline inflorescence is a very unusual character in this genus.

IN the *Philippine Journal of Science*, vol. ix., No. 6, Mr. F. C. Gates gives an ecological account of the swamp vegetation in hot springs areas at Los Baños, Laguna. Hot-water bacteria and Cyanophyceæ were found in the hottest water sometimes more than 56° C., and in the surface water up to 52° C. filamentous blue-green algæ were found. Bacopa and Lippia fringed the pools, and the critical temperature for their growth proved to be from 48°–52° C. Other plants are noticed in connection with their relation to the springs and the swampy ground and the associations which they form.

Tropical Life for April, 1915, contains an interesting letter entitled "The Future of the Solomon Islands," in which an account of the islands is given, and their importance for the production of copra is described. The soil is very fertile, volcanic in origin, mixed with coral limestone, and with the rainfall averaging 90–200 ins., and a very humid climate, the coconut palm flourishes and bears very heavy crops. Some 25,000 acres are now under coconut plantations in the various islands. The palms come into bearing very early, and the writer of the letter records that he saw a tree under six years old bearing considerably more than 300 nuts, which is by no means a record for these islands. As the Solomon group lies on the direct route between Australia and the Philippines and Japan, the importance of the islands is likely to increase in the near future.

IN the current number (vol. xiii., No. 1) of the Bulletin of the Imperial Institute attention is directed to the economic resources of the German colonies, and in particular to the agricultural and forest products of German East Africa. Copra, ground nuts, sesame seeds, oil palms, beeswax, cotton, coffee, grain, sugar-cane, and tobacco, all of which are in native hands, are among the products especially considered. The German East Africa Company also conducts a considerable sisal hemp industry—more than 367,000*l.* worth being exported in 1912—and there is extensive European cultivation of cotton, kapok, plantation rubber, and gutta-percha. The exports of the two latter products in 1912 reached the combined value of more than 362,000*l.* The bulk of the products went to Germany, but some of the rubber, coffee, copal, hides, and ivory have been coming to the United Kingdom.

THE *Kew Bulletin* No. 3 contains papers dealing especially with questions of systematic botany, including descriptions of several new species. In notes on South African Santalaceæ Mr. Hill describes three new species of the singular little diœcious genus Thesidium. In some of the species the male and female plants are so dissimilar that unless found growing together, their relationship would not be recognised. A remarkable etymological invention originating with a misprint is pointed out in connection with the generic name Frisca, a synonym of Thesium, a misprint for *Th. Frisea,* a Linnean species of Thesium. Wettstein, in his "Etymologisch-botanisches Handwörterbuch," has "Frisca (Santalaceæ). Nach Th. Frisca, der sich am Cap im botanischen Interesse aufhielt." The mistake in spelling is due to Endlicher and Spach, but Wettstein is responsible for evolving from what is merely the name of a plant a person who in the interests of botany sojourned at the Cape.

DR. C. F. JURITZ, Government analyst, Cape Town, has recently visited the prickly pear station at Dulacca, Queensland, and contributed an interesting account of the prickly pear problem in Australia, which has been reprinted from the *Cape Times and Farmer's Record* for February 5. His account deals with the methods undertaken under the supervision of Dr. Jean White to eradicate the Opuntia and clear areas for cultivation. Of the two methods employed, the effects of chemicals and the introduction of cochineal, the former is likely to be more effective, since the insect has no effect on the most prevalent species, *O. inermis* and *O. aurantiaca,* which are protected by a layer of subcutaneous cells containing calcium oxalate. Of chemicals only those containing arsenic are of any practical value, and the effect of the gas arsenic trichloride appears to be very promising. The cost of destruction works out at about 15*s.* per acre. The use of the Opuntia as a source of potash and as a source of industrial alcohol promises some return on the outlay for destruction.

THE *Cairo Scientific Journal* for September, 1914, contains an extremely interesting and valuable discussion of "The Frequency of Cloud-forms at Helwan, 1904–1913," by Mr. N. A. Comissopulos. Helwan is situated about eighty miles west of Suez and about 130 miles south-east of Alexandria. The discussion is suggestive in its method and arrangement, and well deserves to be imitated by other observers. The times of observation are 8 and 11 a.m., and 2, 5, and 8 p.m. each day, and the clouds have been tabulated and classified to determine their annual and diurnal variations. Cirrus clouds are shown to be the most frequent of all clouds; they attain their absolute maximum in May and their absolute minimum in July, whilst the cirro-stratus attains two maxima during the year, in December–January and in April, and the absolute minimum is attained in September. Other upper clouds are somewhat irregular. Intermediate clouds, as alto-cumulus and alto-stratus, were rarely seen. For lower clouds it is mentioned that the progress of nimbus is regular, the maximum occurs in January and the minimum in July; stratus has two distinct maxima, one in April and the other in October, with an absolute minimum in June and July. Fogs occur principally in the early morning and during the winter months. Forty-nine per cent. of all observations are clear skies, which shows the relative dry character of the Egyptian weather. The grouping of the clouds for the diurnal variation also gives fairly regular results.

THE papers contributed to a general consideration of the hardening of metals, together with the discussion to which they gave rise at a recent meeting of the Faraday Society, of which an account was given in NATURE of December 3, 1914 (vol. xciv., p. 374), have been reprinted as a brochure by the society with certain additions. The latter include communications from Arnold, Rosenhain, and Thompson. The pamphlet thus gives in a compact form an up-to-date summary of the principal current theories of hardening. After reading it, it is impossible not to be struck by the far-reaching influence of Beilby's theory of the vitreous-amorphous and crystalline conditions of metals and alloys in its bearing on this question, in spite of the statement of Arnold that "no modern theories have disturbed to any great extent the explanation of the hardening of steel made by Henry Clifton Sorby a lifetime ago."

THE June and July, 1914, numbers of the *Journal de Physique,* which is now conducted by the French

Physical Society, have come recently to hand. In the former Prof. Lippmann describes a method of determining differences of longitude by taking instantaneous photographs of the stars at the two stations at the same moment. Prof Bouty continues his examination of the fundamental assumptions of the kinetic theory of gases, and deals with the mean free path. M. J. Duclaux shows that the specific heats of a large number of organic liquids can be calculated directly from their chemical formulæ. The July number contains the lecture on photo-electricity given before the society in April, 1914, by Messrs. Pohl and Pringsheim. In addition to several shorter papers, the two numbers devote between fifty and sixty pages to abstracts of papers which have appeared elsewhere.

THE March issue of the *Presidency College Magazine,* Calcutta, contains a warmly appreciative article by Mr. F. V. Fernandes on the Indian School of Chemistry, with special reference to the work of Prafulla Chandra Rây and his pupils at the Presidency College. Prof. Rây is more particularly known to European chemists from his "History of Hindu Chemistry," and by his investigations on the inorganic and organic nitrites, a field of inquiry with which his laboratory has been specially identified, and with which certain of his pupils have been associated. Under the fostering influence of Principal James, Prof. Rây has gradually built up a distinct Indian School of Chemistry, and after centuries of scientific stagnation, India bids fair to recover something of her former position in the chemical world through the agency of the succession of pupils which have passed through his hands.

IN a recent number of the *Scientific American* (April 24, p. 379) a description appears of what is claimed to be the largest by-product coking plant in the world. Owing to the enormous natural fuel resources of the United States, economy in the use of fuel has received but scant attention. Future generations will have bitter cause for complaint about the prodigal waste of fuel by their ancestors; in no country more so than in that blessed with the greatest supplies. What this waste amounts to is now being realised, and in the production of metallurgical coke the lead of the Continent and Great Britain in the use of recovery plant is being followed. It is estimated that enough benzol to run 200,000 automobiles a year, and enough sulphate of ammonia to supply the farmers of the States with fertiliser for two years at the present rate of consumption, was thrown away in the waste gases of the beehive coke-ovens of the United States in 1912. Altogether the value of the by-products, had they been recovered, would have been about eighty million dollars. If the same amount of coal had been coked in retort ovens, more than five million more tons of coke would have been obtained. The new plant of the United States Steel Corporation comprises 560 ovens, and will produce 2,900,000 tons of coke annually. One hundred and twenty million cubic feet of gas will be obtained every twenty-four hours, half of which will be employed in heating the ovens, the other half for the corporation's steel furnaces. It is remarkable that this big plant is not equipped for the recovery of benzol. Owing to the native supplies of petrol, benzol as a motor fuel is not of that interest in the States which it is in Europe, especially at the present time; but even there benzol recovery will certainly soon become general, if only for the measure of independence it will secure against trusts and rings controlling the output of petroleum products.

"SANITATION IN WAR" is the title of a new book to be published about June 1 by Messrs. J. and A. Churchill, of 7 Great Marlborough-street, London, embodying lectures delivered by Major P. S. Lelean, assistant-professor of hygiene at the Royal Army Medical College. An introduction to the volume has been written by Surgeon-General Sir Alfred Keogh.

OUR ASTRONOMICAL COLUMN.

COMET TEMPEL 2.—A telegram from Prof. Strömgren, of Copenhagen, dated May 18, records the discovery of a comet by Delavan on May 16 at 20h. 52·2m. G.M.T. Its position is given as R.A. 0h. 33m. 1s., and declination −2° 5′ 31″ Its magnitude is not stated. From a communication to the *Morning Post* of May 20 the comet seems to be that of Tempel 2. It is there stated ". . . Tempel 2 has just been re-discovered by Delavan, who has been notably successful at La Plata in the last few years. The comet is probably not bright, and will very likely not be observed in this country, as it rises almost with the sun, and passed perihelion on April 14, only about one day from its predicted date. It is in a direction between the constellation of Pisces and Cetus. It was discovered by Tempel in 1873, and was observed in 1878, 1894, 1899, and 1904, so that three returns, including the last one, were not observed, its period being rather less than 5¼ years."

OBSERVATIONS OF SATURN AT FLAGSTAFF.—Writing to the *Astronomische Nachrichten,* No. 4800, under dates March 11 and 18, Prof. Percival Lowell says (March 11):—"The crepe ring of Saturn has been observed and measured persistently wider on the east than on the west side of the planet during the past month by a difference of five-hundredths. This fact will have important bearings on the mechanics of the stability of the ring. Any phase effect or defect of illumination of the constituents of the ring are not sufficient to explain the phenomenon on account of the diminutive size of the meteorites composing it. A possible explanation of this detected eccentricity of the ring may be the revolution of the perisaturnium." Writing on March 18, he says:—"Photographs of Saturn taken on March 12 at this observatory, both by Mr. E. C. Slipher and the director, confirm visual observations in revealing that Cassini's division is visible in part above the contour of the ball by about four-tenths of its true width. This enables the oblateness of Saturn to be deduced from the photographs, a preliminary reduction of which shows that oblateness to be about one-ninth."

THE SPECTRUM OF THE INNER CORONA.—In the *Ofversigt af Finska Vetenskaps-Societetens Förhandlingar* (Bd. lvii., Afd. A, No. 25) Dr. R. Furuhjelm communicates a note on the spectrum of the inner corona. The photographs were secured by an expedition from the observatory of Helsingfors, which took up its position at Kumlinge, isles of Aland in Finland, for the observation of the eclipse of August 14 of last year. Details of the instrument used are given, but it may be stated that the size of the image falling on the slit was 36·4 mm., and the spectroscope was furnished with three prisms of angles of about